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Citation: Mathwick, C., Wiertz, C. & de Ruyter, K. (2008). Social Capital Production in a Virtual P3 Community. *Journal of Consumer Research: An Interdisciplinary Quarterly*, 34(6), pp. 832-849. doi: 10.1086/523291

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CHICAGO JOURNALS

Journal of Consumer Research, Inc.

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Source: *Journal of Consumer Research*, Vol. 34, No. 6 (April 2008), pp. 832-849

Published by: [The University of Chicago Press](#)

Stable URL: <http://www.jstor.org/stable/10.1086/523291>

Accessed: 08/01/2015 11:59

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Social Capital Production in a Virtual P3 Community

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The purpose of this study is to examine the relational norms that determine social capital—an intangible resource embedded in and accumulated through a specific social structure. The social structure examined in this study is a virtual community created through text-based conversations oriented toward peer-to-peer problem solving (P3). Empirical results support the conceptualization of social capital as an index composed of the normative influences of voluntarism, reciprocity, and social trust. Membership length was found to moderate the virtual P3 community experience. Qualitative analysis of the community dialogue provides additional support for the characterization of virtual P3 activity as community based.

Research documenting the formation of cult brands (Kozinets 2001), brand communities (Muniz and O'Guinn 2001), and product/service-centric tribes (Cova 1997) suggests that a different form of consumption has begun to emerge. Individual transactions are increasingly being augmented by community-based experiences. Cova (1997) characterizes this as a fundamental shift from consumption oriented around the use value of products or services to consumption motivated by the desire to reinforce consumer-to-consumer (or peer-to-peer) bonds that deliver what he refers to as "linking value." Socially embedded consumption of this type enhances the utilitarian nature of a product or service with the value that comes from connecting to a community of users.

This shift in focus from segments of customers to communities of customers requires a reexamination of the fundamentals of the consumption experience (Cova 1997). To aid in that process, we turn to the social science literature, where research into the community phenomenon has historically been framed by theories of social capital. Social

capital is a key metric used to gauge the viability of face-to-face (FtF) neighborhood communities. Characterized as a collectively owned, intangible reserve of support (Bourdieu 1986), social capital has been described as the combination of resources that individuals and groups gain from their connections to one another (Paxton 1999). While the development of a social support system is a primary outcome of social capital accumulation in FtF communities, social capital has also been associated with positive economic benefits that include commitment to community products, services, and community institutions (Coleman 1988; Putnam 1993). This suggests that social capital operates on multiple levels, affecting the relationship quality of individual community members as well as the viability of the community as a social and economic entity (Constant, Sproull, and Kiesler 1996; Michaelson 1996; Minkoff 1997).

There have been references to social capital in the literature encompassed by consumer culture theory (Allen 2002; Arnould and Thompson 2005; Holt 1997, 1998). Aspects of social capital can also be seen in studies of transient communities based on shared consumption interests (Cova and Cova 2001; Kozinets 2002a; Nelson and Otnes 2005). The offline and online communities organized around brands (McAlexander, Schouten, and Koenig 2002; Muniz and O'Guinn 2001; Muniz and Schau 2005), social network analysis (Brown and Reingen 1987), the self-presentation strategies used by individuals to establish an identity within a virtual context (Schau and Gilly 2003), and examples of socially embedded consumption (Frenzen and Davis 1990) all exhibit elements of social capital. We seek to extend this literature by developing quantitative measures of social capital and examining outcomes in the virtual peer-to-peer problem solving (P3) community context.

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John Deighton served as editor and Eric Arnould served as associate editor for this article.

Electronically published November 2, 2007

The ability to create socially embedded consumption experiences has generalized to a wide range of settings with the introduction of interactive technologies. The adoption of technology specifically designed to facilitate the virtual community experience can be seen in figures reported by the Pew Internet and American Life Project. That study indicates that 84% of U.S. Internet users, or some 100 million people, are members of a virtual group (Rainie and Horrigan 2005), while 44% have actively created content for the online world (Lenhart, Horrigan, and Fallows 2004). The most popular type of virtual community is dedicated to finding solutions, exchanging best practices, and building expertise while forging meaningful social relationships, all accomplished through textual conversations (Rainie and Horrigan 2005). We refer to this type of community as a virtual (P3) community. It has been argued that virtual communities generate new forms of social capital that supplement those based on local, physical communities. These forms of social capital, however, are largely left unaccounted for in contemporary social capital theory (Katz and Rice 2002).

Therefore, the purpose of this study is to empirically examine the determinants of social capital and the consequences of its accumulation in a virtual P3 community. The study is designed in three stages. First, we situate the P3 community within the broader community literature to clearly delineate the context for this research. We then synthesize prior conceptualizations of social capital to develop a working definition of the construct. Second, we operationalize the social capital construct in a virtual P3 community context and test its consequences using quantitative techniques. The conditions under which social capital is transformed into commitment to a virtual P3 community are empirically tested. Finally, we validate and extend our empirical findings with an interpretation of qualitative data collected from the archived discussion threads found in our virtual P3 community context.

BACKGROUND

The Virtual P3 Community

The virtual P3 community examined in this study falls within the general domain of electronic “networks of practice,” defined as “self-organizing, open activity systems focused on a shared practice that exists primarily through computer-mediated communication” (Wasko and Faraj 2005, 37). Networks of practice are designed to facilitate knowledge sharing and learning, by bringing together individuals working on similar problems (Brown and Duguid 1991; Nahapiet and Ghoshal 1998). Communities and networks of practice have been mainly investigated in an organizational context with a focus on exchanges between coworkers and independent professionals (Brown and Duguid 1991; Wasko and Faraj 2005; Wenger and Snyder 2000). A virtual P3 community, in contrast, tends to cater mainly to consumers who are “working” to solve problems related to their shared consumption experiences.

Since virtual P3 communities are often sponsored by a corporate entity, it is not possible to unequivocally separate them from brand communities that are also consumption based (e.g., Kozinets 2001; McAlexander et al. 2002; Muniz and O’Guinn 2001). However, it is possible to discern differences in focus and experiential consequences. While virtual P3 activity does occur in brand communities (Muniz and Schau 2005), dialogue in these communities tends to revolve around brand-related narratives that emphasize expressive, hedonic, or social interaction (Cova and Cova 2001; Kozinets 1997; Leigh, Peters, and Shelton 2006). Virtual P3 communities, by contrast, often evolve from pragmatic origins (Bagozzi and Dholakia 2006; Nelson and Otnes 2005; Wasko and Faraj 2005) that do not necessarily relate directly to a specific brand. For example, both the members of Lonely Planet’s Thorn Tree Forum as well as the members of the independent community VirtualTourist.com share their travel experiences to help solve each other’s travel-related problems. The former community is directly linked to the Lonely Planet brand while the latter is free of any specific brand association. Nevertheless, the content of the interactions in both communities addresses travel-related questions, as opposed to specific brand-related narratives. Thus, we differentiate virtual P3 communities from brand communities in that a brand-specific focus is not a precondition of virtual P3 community formation; rather, the primary *raison d’être* is peer-to-peer problem-solving activity related to consumption experiences of any type.

This is not to say that virtual P3 communities are purely utilitarian. They offer an outlet for sharing consumption experiences that can facilitate the creation of socially embedded linking value, as described by Cova (1997). As the social dimension of the virtual P3 community begins to develop, the affiliative tone of the community takes shape. Although this affiliation is based on problem solving among peers, the utilitarian nature of the community is gradually subsumed by social interaction (Sonnemans, van Dijk, and van Winden 2006), illustrating the dynamic process that we believe leads to social capital formation.

Social Capital: The Components That Underlie Its Formation

Social capital is said to be an intangible force that helps to bind society together by transforming self-seeking individuals into members of a community with shared interests, shared assumptions about social relations, and a sense of the common good (Etzioni 1996). Described as “wonderfully elastic” (Lappe and DuBois 1997, 119), social capital has been applied at both the individual and collective levels. It has also been labeled as an umbrella concept that covers both the process of social capital accumulation as well as its outcomes (Adler and Kwon 2002; Nahapiet and Ghoshal 1998). Building on these characterizations, we strive to refine our definition of social capital as a construct that is useful for the study of consumption behaviors. We focus on both its (1) social and (2) capital elements as well as (3) the per-

sonal benefits that flow from this resource to construct the definition used in this study.

In relation to the term "social," scholars differ in whether social capital is an asset at the individual or collective level. On the one hand, social network theorists (Burt 1997) view social capital as a private good that can be obtained by individuals and used for their personal benefit. Alternatively, social capital is also said to exist as a public good, a community common (Burt 1997; Putnam 1993) that is "socially generated, maintained, and exchanged" (Brown and Duguid 1991; Wasko and Faraj 2000, 156) to create resources that are owned by no one but used by all members of a social system. In the empirical portion of this study, we focus on the process of social capital accumulation and the consequences realized at the individual level. We turn to an examination of the community-level consequences of social capital formation in an interpretation of qualitative data collected from community discourse.

Social capital arises within relationally embedded networks infused with norms of voluntarism (Gamm and Putnam 1999), reciprocity (Coleman 1988; Paxton 1999), and social trust (Putnam 1995). These three normative influences are discussed in different combinations across a variety of studies (Bourdieu 1986; Nahapiet and Ghoshal 1998; Newton 1997; Putnam 1993; Stolle 2001). Combining their influence, as we do here, allows us to synthesize prior work to develop a comprehensive index to quantify the level of social capital reserve available to a community and its membership.

Whereas the value of financial capital accumulates as stock, denominated in monetary units, the value of social capital is based on the perception of its outcomes or (mutual) benefits arising from social investments. When social capital accumulates in organizational contexts, enhanced stocks of knowledge or efficient transfer and use of information are often mentioned as instrumental benefits (Adler and Kwon 2002). At the same time, it has been argued that social capital also accrues in expressive benefits or nonmarket returns (Glaeser 2001), in the form of social support.

Based on this discussion and in line with Adler and Kwon (2002), we propose the following working definition of social capital: social capital is an intangible resource from which instrumental and expressive benefits will flow, benefits that are available at the individual or communal level, embedded in and accumulated through a specific social structure and governed by relational norms of voluntarism, reciprocity, and social trust.

The online environment of a virtual P3 community gives rise to unique interaction patterns that can foster as well as undermine social capital accumulation. In the following section, we discuss some of the unique contextual influences that shape the underlying norms of voluntarism, reciprocity, and social trust that determine social capital in a virtual as compared to a face-to-face community setting.

Norms of Community Voluntarism

Americans have a "long term proclivity" toward voluntarism that dates back to the mid-eighteenth century (Gamm

and Putnam 1999, 511). However, civic voluntarism differs from the actions of members of a virtual P3 community. For example, online interaction occurs between strangers who are unlikely to ever meet face to face. As a consequence, individuals come and go with few restrictions or social ramifications (Balasubramanian and Mahajan 2001). These virtual gatherings are loose and amorphous networks of individuals drawn together by common interests, dedicated "to solving collective problems, and pursuing specific goals" (Paxton 1999, 100). Critics of the argument that social capital creation can accumulate online contend that the continuous influx of strangers into an existing community base would disrupt the interdependencies and shared history thought to be crucial to the formation of social capital (Nahapiet and Ghoshal 1998; Wasko and Faraj 2005).

We believe, however, that the freedom to come and go with impunity is what makes for a more genuine culture of voluntarism online. Based on "habits of the heart," contributors to a virtual P3 community are making a "commitment of time and effort that is given freely to benefit another person, group, or organization" (Wilson 2000, 216). This freedom to act creates a culture of spontaneous sociability (Fukuyama 1995), rather than one in which community members are simply responding to community expectations. This culture of proactive engagement in community life tends to foster social capital more effectively than community acts motivated by public appearance or social expectation (Putnam 1993).

Norms of Reciprocity

From its early days, the Internet culture was built on norms of collaboration, cooperation, and a willingness to share resources when others requested them (Rheingold 1993). Sharing is still encouraged, and the tendency to forgo the temptation to free ride suggests that a generalized norm of reciprocity governs online interaction (Constant et al. 1996; Rheingold 1993; Wasko and Faraj 2000; Wellman and Gulia 1999).

Generalized reciprocity makes direct reciprocity between two individuals unnecessary (Constant et al. 1996). Described as a "mutuality of gratification" (Gouldner 1960, 168), individuals operating under a generalized norm of reciprocity provide service to others at a personal cost but with the expectation that their kindness will be repaid at some undefined point in the future (Onyx and Bullen 2000). Repayment may be in the form of exchanges in-kind, exchanges of some alternate form of aid, or it may simply involve helping a mutual friend in the social network (Wellman and Gulia 1999). In a virtual P3 context, repayment becomes a moral obligation that is reflected in comments that indicate that participants help others because "it is the right thing to do" (Wasko and Faraj 2000, 168).

The expectation of repayment imposes an informal social control that obviates the need for more formal, institutionalized legal sanctions (Coleman 1988; Muniz and O'Guinn 2001; Paxton 1999). The result is a highly efficient social system that requires little formal policing (Coleman 1988).

In an online peer-to-peer file sharing network, Giesler (2006) observed a strong generalized norm of reciprocity, identifying it as an essential stabilizer of that particular social system. Norms of reciprocity predispose individuals to “cooperate, understand, and empathize” rather than “treat each other as strangers, competitors, or potential enemies” (Newton 1997, 576). The stability this predisposition fosters is an essential prerequisite to the accumulation of social capital (Putnam 1995).

Norms of Social Trust

In the early days of a relationship, the norm of reciprocity is tacitly involved in establishing social trust (Newton 1997). Social trust—also referred to as in-group trust—results from cooperation and repeated interactions with one’s immediate circle, including friends, family, and voluntary associations (Stolle 2001). In the context of a virtual P3 community, social trust is exhibited when members place trust in individuals or social institutions linked by virtual interaction. Despite a lack of direct previous interaction or subsequent relationships (Hardin 2001), members exhibit “a willingness to take risks, based on confidence that others will respond as expected, will act in mutually supportive ways, or at least will not intend harm” (Onyx and Bullen 2000, 24). Based on a history of positive interaction (Wasko and Faraj 2005), social trust leads to the sense that cooperation with association members carries few risks (Hardin 2001). Consequently, as social trust takes root, it mitigates concerns about relinquishing power, even to strangers, as long as they share an affiliation.

Given that members of virtual P3 communities must rely on the advice of anonymous strangers, the risks and uncertainties that can erode trust can become magnified (Reichheld and Scheffer 2000). Therefore, if social trust does develop in a virtual P3 context, it is likely to be directed toward more abstract others or institutions embedded in a particular social structure rather than toward specific individuals (Paxton 1999). This implies that social trust, like reciprocity, eventually becomes a generalized norm of the community in that “it makes sense to risk entering into exchanges” even though “one does not yet have either an ongoing relationship or reasons of reputation to trust” exchange partners (Hardin 2001, 15).

The normative influences of voluntarism, reciprocity, and ultimately social trust are illustrated in the following post excerpted from the virtual P3 community that is the research context for this study. This exchange took place between two community regulars whose sentiments exemplify the social milieu of this community:

Alberto: If you take a look at this thread [weblink to thread provided], you will see a clear example of forum abuse [that occurs all too frequently] by one “Eddie.” Specifically, this poster insults users, here calling them “stupid” and needing to be “spoon fed.” This is neither helpful nor professional—and is clearly destructive to the forum’s purpose of assisting users with their technical support issues. Responses to technical

queries should not result in forum regulars leveling personal attacks against users who are less technically adept th[a]n they are.

Lawrence: I went to read the entire thread start to finish and I have to agree with Alberto. I too have had the same negative experience with “Eddie” and others like him. I do a lot of forum support work myself—helping the frustrated, annoyed, and newbie. Resorting to personal attacks upon the entity seeking help is just pointless. These experienced wikis should know better, have some empathy, or if nothing else, just remain silent if they have no real assistance to provide.¹ [Experienced users] don’t spend their time belittling frustrated users—rather they stay on topic and answer the issue at hand in a clear manner. That is what a wiki, to deserve the term, ought to do . . . no?

In this exchange, Eddie has violated the norm of social trust with his verbal attacks on the community “newbies.” The culture of voluntarism and the informal code of conduct articulated here has led to a stratified social system that is based on product knowledge or technical expertise as community newbies evolve toward the coveted status of “wiki.” The interactions in this virtual P3 community are guided by the norms of voluntarism, reciprocity, and social trust, creating a reserve of support available to be drawn upon by community members. Therefore,

H1: As the norms of reciprocity, voluntarism, and social trust strengthen, the level of social capital will increase.

Information Resources and Social Support: Outcomes of Social Capital Accumulation

Social capital theory is centrally concerned with how the social structure of a group functions as a productive resource (Nahapiet and Ghoshal 1998; Paxton 1999). The use of the term “capital” implies that it is not a good in and of itself but a means to a set of outcomes. The specific outcomes of social capital are highly contextualized, surfacing as watch groups in FtF neighborhoods (Paxton 1999) or as voter turnout or letter-writing campaigns within the context of social action communities (Minkoff 1997). Given that information seeking tends to be the primary objective behind initial Web site visits (Adler and Kwon 2002; Armstrong and Hagel 1996; Inkpen and Tsang 2005; Ridings and Gefen 2004; Wasko and Faraj 2000), the creation of an information resource and the sharing of knowledge are the overt outcomes of participation. Muniz and Schau’s (2005, 742) description of the mystical, almost religious character of the Newton brand community vividly illustrates the “search for knowl-

¹“Wiki” is the Hawaiian term for “quick.” The “wikis” of this virtual P3 community take their name for the software used to create Wikipedia, which allows individuals to contribute information in real time to the creation of an interactive global encyclopedia.

edge" that is at the heart of any virtual P3 community interaction.

The social practices of the community establish a history of trustworthy interaction, whereby participants become receptive to the problem-solving process. This trusting climate facilitates collaboration and enables the creation of a resource that would be impossible, or at least more costly to produce, were people working in isolation (Nahapiet and Ghoshal 1998). Couple this with the implied independence and credibility afforded to peer feedback (Brown and Reingen 1987), and the solutions generated by a virtual P3 community become much more valuable than the "simple aggregation of the knowledge of a set of individuals" (Nahapiet and Ghoshal 1998, 248).

Therefore, when the normative influences underlying social capital accumulation guide responsible and relevant contribution to community problem solving, the perceived value of the resulting information resource is predicted to increase.

H2a: Social capital will exert a positive influence on the perceived value of the informational resources available from a virtual P3 community.

Once information resources are made available to one person, a public good is created and is accessible to all others at no additional marginal costs, without being used up (Olson 1965). Individuals cannot be excluded from consuming public information, regardless of whether they have ever actively contributed anything themselves (Wasko and Faraj 2000, 2005; Wasko, Faraj, and Teigland 2004). Despite the fact that there are ample opportunities for members to lurk and free ride, a situation known as the collective-action problem (Olson 1965; Ostrom 2000), the emergence of social capital counters susceptibility to this tendency to consume a public good without contributing to its creation. Consequently, information seeking turns into information sharing as participants invest more, perceive they receive more, and continue to reinvest on any number of affective, cognitive, or behavioral levels (Clark and Mills 1993).

The social link that P3 activity establishes over time is fundamental to the transition from information seeking to information sharing. Even when virtual communities are not explicitly designed to be socially supportive, they often tend to be (Wellman and Gulia 1999). For example, virtual communities will often begin to form a "social core," independent of commercial or instrumental interests (Balasubramanian and Mahajan 2001, 109). The existence of this social core is well documented in online community environments, with evidence that virtual interaction can serve as a source of intimate social support comparable to offline relationships (Rheingold 1993). These relationships provide a sounding board for problems and offer camaraderie to participants, transforming the virtual P3 community into as much a social entity as it is a commercial service. The social support created from reserves of social capital can be personally realized or may simply come to exist as potential energy to be tapped at some point in the future (Bourdieu 1986; Gamm and Putnam 1999; Kawachi, Kennedy, and Glass 1999;

Onyx and Bullen 2000; Paxton 1999). This potential for support gives substance to the relationships forged online, endowing them with value that extends beyond intimacy between individuals. The value inherent in a virtual P3 community's social support system resides in the knowledge that the entire community is there to be tapped, should the need arise.

Through ongoing community engagement, the normative influences that build social capital become ingrained, inspiring confidence in the motives of community members. Consequently, the relationship between social capital and the social support system of a virtual P3 community is direct and positive. As social capital grows, the perceived value inherent in the consequent social systems will also increase.

H2b: Social capital will exert a positive influence on the perceived value of the social support systems available from a virtual P3 community.

Social Capital: The Process of Building Community Commitment

It has been argued that social capital, much like economic capital, is a force of both inclusion and exclusion (Bourdieu 1986) insofar as theories of social capital strongly associate the accumulation of means to particular, even opposing, factions within a given social network. Exchange transforms the things exchanged into signs of recognition that imply group membership. Holt (1997, 343) argues that "when people enact their tastes through particular consumption patterns, they are enacting symbolic boundaries that affirm distinctions between collectivities." Consequently, an important demarcation in social position exists between the social core and the periphery of a collective.

One approach to identifying the boundaries that exist between the core and peripheral factions operating in a virtual P3 community is membership length. The passage of time influences the stability and continuity of social structures (Nahapiet and Ghoshal 1998) as well as individual perceptions of the community experience (Bagozzi and Dholakia 2006). Initially, people join and learn about a community from its periphery by observing the actions of others. As they acquire knowledge and begin to demonstrate their expertise, newbies move toward full participation in the socio-cultural core of the community. Consequently, initial participation from the periphery is essential to gradual socialization into the practices of a community (Lave and Wenger 1991). To shed light on this socialization process, we contrast the long-term affiliates who comprise the "core" of a P3 community to the newbies who operate on the community's periphery.

The Newbie Experience

When interacting on-line, "initial participation by novice users is driven by specific task-oriented goals" (Bagozzi and Dholakia 2006, 1111). This is particularly the case when

the peer-to-peer problem-solving activity occurs within firm-sponsored communities of practice (Constant et al. 1996; Wasko and Faraj 2005). Newbies to such environments receive value from the informational resources they consume and simultaneously incur a moral obligation, repayable by making contributions in-kind (Wasko and Faraj 2000). This pattern causes the value of the community's information resources to compound not in a linear fashion but exponentially, as "knowledge is constantly being regenerated and re-contextualized, in order to maintain its relevance to the community" (Wasko and Faraj 2000, 161). Information becomes the currency for repayment of community obligations, creating a self-perpetuating cycle of give and take that fuels commitment to the community.

Commitment, which is evident in the desire to maintain community relationships, creates a continuing sense of obligation to help others based on shared community experiences (Constant et al. 1996; Wasko and Faraj 2005). Firm-sponsored virtual communities of a technical nature, such as the one examined in this study, serve as a venue for information exchange, rather than as a forum to socialize and develop personal relationships (Wasko and Faraj 2000), particularly among novices to the community (Bagozzi and Dholakia 2006). Consequently, community commitment, to the degree that it exists among newbies, is likely to be framed in terms of the community's informational resources.

- H3:** Commitment to a virtual P3 community among newbies will be determined by the value of the perceived information resources of the community.

Long-Term Affiliates: The "Wikis" at the Community Core

The wikis who have maintained a long-term affiliation with a virtual P3 community come to understand, simply by virtue of their tenure, how their expertise enables them "to share knowledge with others" (Wasko and Faraj 2005, 42). Through their experience, the community's social core learns that it is not necessary to personally draw upon the community resources to benefit from them. Simply knowing that community support exists is often enough to cement commitment. As a consequence, discrete transactions are replaced by a willingness to invest in P3 activity for its own sake, without the expectation of repayment from specific exchange partners (Mathwick 2002). Consumption is transformed into collaboration that supports the welfare of others (Wasko and Faraj 2000) as the collective information resources of the community are created and maintained.

Contributors are socialized into the community as a natural consequence of prolonged information exchange (Ahuja and Galvin 2003; Bagozzi and Dholakia 2006; Sonnemans et al. 2006). Socialization brings with it companionship, emotional support, and eventually the development of a sense of belonging (Wellman and Gulia 1999). This sense of belonging establishes a boundary that delimits "us" from

"them" and creates an environment of emotional safety that encourages self-disclosure and intimacy (McMillan and Chavis 1986).

Consequently, among the long-term core members, the community experience is not defined exclusively by information resource exchange. Problem solving is augmented by the "linking" value inherent in the community's social support system (Algesheimer, Dhokalia, and Herrmann 2005; Cova 1997; Hagel and Armstrong 1997). Over time, we predict there will be stronger emphasis on social support and expressive value (Sonnemans et al. 2006) such that the social dimension will not only influence commitment to a virtual P3 community but may come to define it. Therefore,

- H4a:** Among the experienced wikis, perceived social support will overshadow information resources as the most significant determinant of commitment to the virtual P3 community.
- H4b:** When compared to virtual P3 community newbies, the experienced wikis at the core will perceive heightened value in the informational resources and social support systems, and will exhibit greater commitment to the virtual P3 community.

METHODS

Research Setting

We collected both quantitative and qualitative data in a virtual P3 community sponsored by a firm that develops software for digital media creation and editing, multimedia authoring, and Web development. The community is based on a number of asynchronous discussion boards (forums) dedicated to each of the sponsor's various product lines, as well as to more general issues, such as advice on designing Web sites. As a consequence, community participants exchange a combination of technical and social information to support the use of these products on both personal and professional levels. As a free-of-charge e-support service, the community is accessible to customers and noncustomers based solely on registration. The community serves a domestic as well as international customer base. However, this study was linked to the English language version of this firm's Web site.

Quantitative Data Collection and Study Sample Characteristics

An online survey linked from a number of locations on the firm's home page and from its various product-specific Web pages was used for data collection. The survey was posted online for a 10-week period during the third quarter of 2003. One thousand nine hundred eleven visitors to the virtual P3 community Web site self-selected to participate in the survey, completing the initial demographic and screening questions. These initial questions were used to

determine whether the respondent had participated in the community aspects of the Web site. From that response pool, 254 of the respondents reported being P3 community patrons. Only these respondents were invited to complete the full survey and thus represent the full sample used for this analysis.

In contrast to the nonusers, P3 community patrons were an older, largely male group of customers of the sponsor's product line. This user group was more formally trained in the use of this software than were the nonusers of the P3 community, with 31% of the community user group indicating relevant software experience, as compared to only 16% of the overall Web site visitors. This user group was slightly older, with 41% over 45 years of age as compared to 32% of the respondents who visited the community home page but did not utilize the community services. Although the overall study sample is composed largely of male users of the P3 community services, the community did attract a significantly larger proportion of women than found on the Web site in general (31% of the P3 community users were female as compared to 18% of the nonusers).

The usage pattern associated with this virtual P3 community is divided as follows: approximately 34% of respondents ($n = 86$) report being new members to the site, visiting for less than 6 months; 27% ($n = 68$) report a visitation history extending beyond 2 years, with the remainder falling between these two extremes. We compare the first two groups to each other in order to test hypotheses 3 and 4a–b, which examine differences in the community experience among newbies versus the long-term core members.

Unique identifiers for each respondent were not available, making direct survey registration impractical. Visitor traffic to the site, however, was analyzed using WebTrends Live software—a system that records unique and repeat visitation rates. These data indicate that less than 5% of the 1,911 visitors to the survey site were repeat visitors. Assuming the repeat visitation levels were consistent among those who visited the site and those who actually completed the survey, we estimate that approximately 12 of the completed surveys could represent multiple submissions. As a consequence, multiple survey submissions from one individual were not seen as a serious threat to the quality of the data collected.

The scales administered in this study were adopted from existing literature. Social capital accumulation was modeled as an index formed by norms of reciprocity (Wasko and Faraj 2000), norms of voluntarism (Podsakoff, Ahearne, and MacKenzie 1997), and norms of social trust (Moorman, Zaltman, and Deshpande 1992). Informational value, social value, and community commitment (Mathwick and Klebba 2003) were adopted from existing work. All items were administered using five-point Likert-type scales anchored by strongly agree/disagree.

Qualitative Data Collection

In addition to the survey data, we also collected observational data using netnography (Kozinets 2002b). Two of the authors spent considerable time observing select dis-

cussion threads from the communities' archives to develop richer insight into community interaction. Threads were chosen to reflect a range of different community member discussion topics relevant to the theoretical frameworks investigated in this study. The discussion threads were categorized using three distinct theoretical approaches. First, to validate the social capital framework proposed in this study, we categorized discussion threads according to the normative influences that were observed: voluntarism, reciprocity, and social trust. Second, we applied Muniz and O'Guinn's (2001) traditional "markers of community": consciousness of kind, rituals and traditions, and moral responsibility to determine whether there was evidence of these markers in the community dialogue. Finally, because social capital can accrue and be dispensed at both the individual and communal level, we categorized discussion topics according to whether they were addressing individual or communitywide issues. The affective sentiment of each discussion thread was also recorded, as were the broader themes that emerged.

Analysis Plan

We estimated the measurement as well as structural parameters in our empirical model using partial least squares (PLS), specifically PLS-GRAPH version 3.0. PLS is a powerful multivariate causal modeling technique for relations between multiple dependent and independent latent constructs. It is most appropriate when the model incorporates both formative and reflective indicators and when assumptions of multivariate normality cannot be made (Chin 1998; Diamantopoulos and Winklhofer 2001). Our model and data meet these conditions, since social capital is modeled as a formative latent variable that is determined by the three first-order, reflective constructs: reciprocity, voluntarism, and social trust.

Analysis of the observational data involved an iterative process. One author read each archived posting several times, devised categories, and grouped postings into like categories. The other author then audited these categories, challenging existing interpretations and making suggestions for changes. The emerging themes were discussed until the authors were satisfied that they had achieved sufficient interpretive convergence (Kozinets 2002b).

RESULTS OF QUANTITATIVE DATA ANALYSIS

Measurement Model

The measurement model was estimated using the full data set. Its adequacy is assessed by looking at individual item reliabilities, the convergent validity of the measures associated with individual constructs, and the discriminant validity between constructs (Fornell and Cha 1994; White, Varadarajan, and Dacin 2003). Item reliabilities are evaluated by examining the loadings of each measure on its respective construct. All measures with loadings higher than .50 (Hulland 1999) are retained for analysis. As all our

TABLE 1
MEASUREMENT MODEL RESULTS

Construct and description of items	Loading	t-value
Social capital		
Norms of reciprocity:	.330	29.15
When I receive help, I feel it is only right to give back and help others	.964	59.71
Members should return favors when the XYZ community is in need	.979	69.79
Norms of voluntarism:	.399	16.21
I assist fellow XYZ users in finding solutions to their problems	.850	40.17
I am willing to work together with others to improve the XYZ experience	.856	45.91
I keep up with the latest technical developments in order to make useful contributions to the XYZ community	.821	36.23
Norms of social trust:	.450	23.22
I trust XYZ contributors to know things I don't know	.815	23.85
I would base an important decision on advice I received from the contributors to this XYZ forum	.845	38.85
Contributors to the XYZ forum have high integrity	.842	35.23
Informational value:		
I find the information on this XYZ forum to be valuable	.941	113.97
I think of this XYZ forum as an information resource	.933	85.49
There is unique value in the XYZ forums	.925	74.58
Social value:		
I think of the patrons of this XYZ forum as my extended family	.792	24.23
Participating on this XYZ forum provides an important source of camaraderie for me	.846	36.82
This XYZ forum provides a sounding board for my ideas	.864	48.06
I rely on the personal support I get from others in this XYZ forum	.709	14.60
Virtual P3 community commitment:		
The relationship I have with this XYZ forum is important to me	.888	66.34
I really care about the fate of this XYZ forum	.902	123.86
The relationship I have with this XYZ forum is one I intend to maintain indefinitely	.932	51.63

measures have loadings higher than .70, we did not have to delete any items. All items and their associated loadings and *t*-values are reported in table 1.

Convergent validity of the first-order, reflective constructs is assessed using composite scale reliability and average variance extracted (Chin 1998; Fornell and Larcker 1981). Composite scale reliability ranged from .81 to .96, exceeding the recommended cutoff value of .70 (Nunnally and Bernstein 1994). The only exception is reciprocity, which has a composite reliability of .65 and thus falls marginally below the recommended cutoff. This lower composite reliability is probably due to the fact that the construct is only measured by two items. Average variance extracted ranges from .59 to .90, exceeding the cutoff value of .50 suggested by Fornell and Larcker (1981). Again, the only exception is reciprocity, which falls slightly short, with an average variance extracted of .48.

Discriminant validity is examined for each construct in three ways (White et al. 2003). First, we compared the square root of the average variance extracted with the correlation between two latent constructs (Fornell and Larcker 1981). Discriminant validity is supported when the square root of the average variance extracted exceeds this correlation. Second, each correlation should be less than one by an amount greater than twice its respective standard error (Bagozzi and Warshaw 1990). Finally, an examination of the theta matrix should confirm that all items load highest on their associated construct. All off-diagonal elements in the

theta matrix should be below |.20| (Falk and Miller 1992). All of our constructs meet these requirements, exhibiting satisfactory discriminant validity. Composite reliabilities, average variance extracted, and the correlations between constructs are summarized in table 2. In addition, table 3 presents the correlations between all items.

As we collected the data on both independent and dependent variables from the same pool of respondents, the potential for common method variance exists. In order to address this potential problem, we used the approach proposed by Lindell and Whitney (2001). We recalculated the

TABLE 2
COMPOSITE RELIABILITY, AVERAGE VARIANCE EXTRACTED, AND CORRELATIONS

	CR	AVE	Rec	Vol	Trust	IV	SV	Commit
Rec	.65	.48	.693					
Vol	.81	.59	.556**	.768				
Trust	.93	.81	.631**	.498**	.900			
IV	.87	.68	.676**	.429**	.755**	.825		
SV	.93	.77	.474**	.657**	.626**	.467**	.877	
Commit	.96	.90	.498**	.583**	.624**	.674**	.591**	.949

NOTE.—CR = composite reliability, AVE = average variance extracted, Rec = reciprocity, Vol = voluntarism, IV = informational value, SV = social value, Commit = commitment. Numbers in bold on the diagonal denote the square root of the average variance extracted.

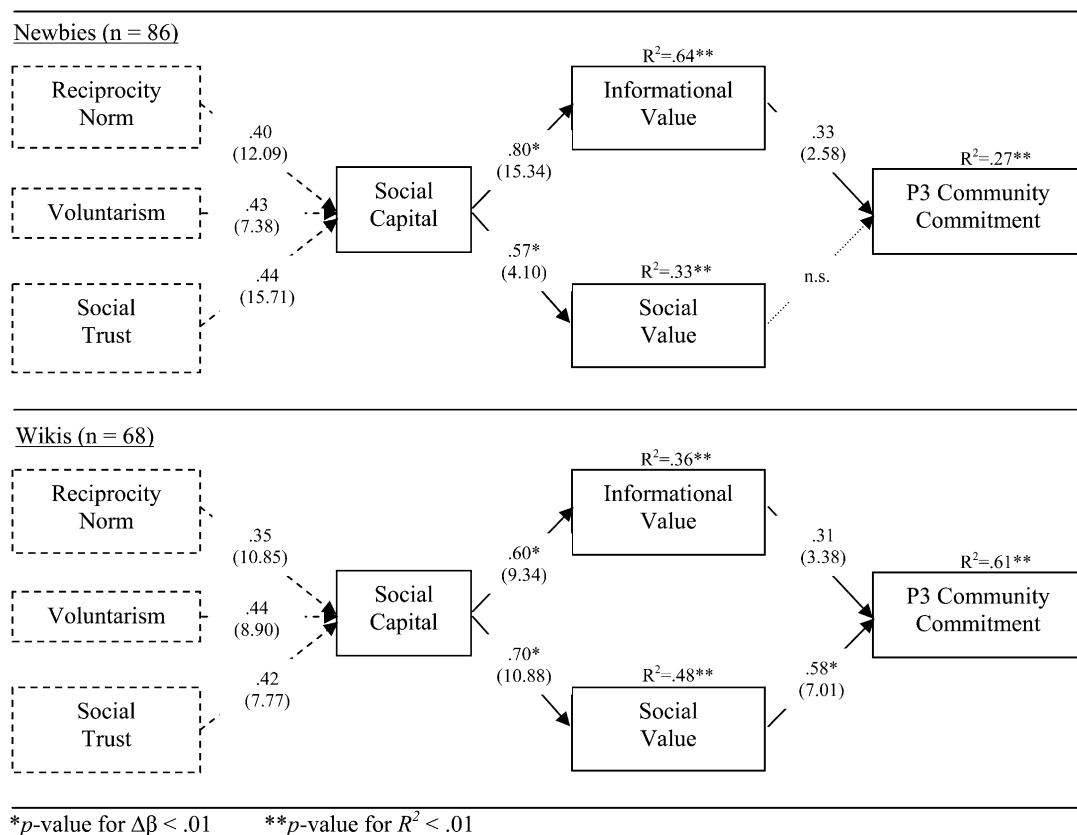
***p* < .01.

TABLE 3
FULL CORRELATION MATRIX

	Rec1	Rec2	Vol1	Vol2	Vol3	Trust1	Trust2	Trust3	IV1	IV2	IV3	SV1	SV2	SV3	SV4	Com1	Com2	Com3
Rec1	1.000																	
Rec2	.686**	1.000																
Vol1	.442**	.399**	1.000															
Vol2	.471**	.478**	.587**	1.000														
Vol3	.387**	.407**	.587**	.522**	1.000													
Trust1	.497**	.453**	.203**	.437**	.242**	1.000												
Trust2	.470**	.508**	.334**	.499**	.386**	.523**	1.000											
Trust3	.394**	.564**	.256**	.442**	.363**	.517**	.563**	1.000										
IV1	.645**	.536**	.299**	.462**	.294**	.600**	.614**	.570**	1.000									
IV2	.614**	.506**	.246**	.456**	.207**	.622**	.536**	.558**	.827**	1.000								
IV3	.658**	.506**	.314**	.522**	.247**	.583**	.621**	.537**	.787**	.783**	1.000							
SV1	.266**	.385**	.434**	.389**	.337**	.414**	.473**	.508**	.454**	.355**	.450**	1.000						
SV2	.243**	.317**	.458**	.456**	.584**	.209**	.458**	.333**	.286**	.176**	.321**	.527**	1.000					
SV3	.392**	.426**	.509**	.549**	.617**	.384**	.523**	.465**	.427**	.317**	.444**	.529**	.713**	1.000				
SV4	.316**	.461**	.312**	.308**	.405**	.305**	.492**	.481**	.363**	.284**	.340**	.474**	.447**	.486**	1.000			
Com1	.404**	.389**	.466**	.503**	.398**	.424**	.449**	.331**	.504**	.442**	.496**	.482**	.511**	.476**	.299**	1.000		
Com2	.478**	.411**	.453**	.542**	.398**	.589**	.529**	.352**	.567**	.551**	.635**	.482**	.446**	.460**	.243**	.688**	1.000	
Com3	.415**	.377**	.405**	.525**	.306**	.522**	.554**	.409**	.660**	.582**	.645**	.565**	.441**	.476**	.278**	.744**	.727**	1.000

NOTE.—Rec = reciprocity, Vol = voluntarism, IV = informational value, SV = social value, Com = commitment.
** $p < .01$.

FIGURE 1
RESULTS



correlations reported in table 2, as well as the associated t -statistics, using Lindell and Whitney's formulas to control for common method variance. If significant unadjusted zero order correlation coefficients remain significant after adjusting for common method variance, this suggests that the results are genuine and cannot be accounted for by common method variance. After adjusting for common method variance, all correlation coefficients remained significant. Hence, we can conclude that common method variance does not seem to pose a severe problem to our data.

Social Capital Indicators and Consequences

We tested the structure of social capital (hypothesis 1) using the full data set. Given that social capital is operationalized as a formative latent construct, it was specified as the linear sum of voluntarism, reciprocity, and social trust. Formative indicator models are statistically underidentified (Bollen and Lennox 1991), therefore, they can be estimated only if placed within a nomological net that incorporates consequences of the latent variable (Bollen 1989). Therefore, hypotheses 2a–2b, which relate to the value-based outcomes of social capital accumulation, were simultaneously modeled (Jarvis, MacKenzie, and Podsakoff 2003).

The results indicate that the three normative influences, voluntarism ($\beta = .40$; $t = 16.21$), reciprocity ($\beta = .33$; $t = 29.15$), and social trust ($\beta = .45$; $t = 23.22$) are all significant formative dimensions of social capital. The test of hypotheses 2a–2b was also supported with a positive relationship emerging between social capital and information value ($\beta = .75$; $t = 24.89$; $R^2 = .57$), as well as social capital and the perceived value of the social support system ($\beta = .71$, $t = 18.28$; $R^2 = .51$).

To test the remaining hypotheses, we specified two additional structural models, the first using the data from the subgroup of community newbies (i.e., membership length of 6 months or less), followed by the long-term core member subgroup (i.e., membership length of more than 2 years). In figure 1 we summarize the results. The beta coefficients and associated t -values are reported for each hypothesized relationship, along with the R^2 for each endogenous construct, as indicated by the PLS analysis.

Among the newbie subgroup, both informational resources ($\beta = .80$; $t = 15.34$; $R^2 = .64$) and social support ($\beta = .57$; $t = 4.10$; $R^2 = .33$) were perceived as significant outcomes of the community's social capital. As expected, informational resources were found to be a significant predictor of community commitment ($\beta = .33$; $t = 2.58$), ex-

plaining 27% of the variance and providing support for hypothesis 3. The social value–community commitment link was also freed for estimation but was found to be nonsignificant.

The second structural model focused on the long-term core community of wikis. The results provide support for hypotheses 4a and 4b. Informational resources ($\beta = .31$; $t = 3.38$) and the social support system ($\beta = .58$; $t = 7.01$) were both significant predictors of P3 community commitment, explaining 61% of the variance and providing support for hypothesis 4a. As expected, the value of the social support systems perceived by these core members proved to be the dominant determinant of community commitment.

To test hypothesis 4b, we used MANOVA to examine mean differences between core community members and newbies. In support of our hypothesis, the means of all study variables are significantly heightened by long-term membership in the community. Table 4 summarizes these findings.

RESULTS OF QUALITATIVE DATA ANALYSIS

The unique context of a virtual P3 community influences the nature of the community interactions and the social capital production that we observed. In the archived community conversations of the particular P3 community that we studied, we found evidence of the three norms underlying social capital, the traditional markers of “community,” as well as examples of bonding and collective action. As might be expected, examples of positive, negative, and neutral sentiment were found throughout the archives of the community discussion threads. The overriding majority of discussion threads could be classified as neutral comments that tended to be direct responses to specific questions, offering little or no elaboration. These comments illustrate the information exchange focus of this virtual P3 community. The following is an exchange that illustrates the culture of voluntarism permeating this virtual P3 community:

Ron: Hi, I received a file from someone in Japan that I cannot read or print. The help file tells me that I need a language font kit, and that the update feature will pick this up for me automatically when I open the file. However, while the update feature is triggered it does not succeed, coming back with no updates available at this time. Any ideas on how I can read this file, or alternative ways to get this language font kit?

OriginalGangster: You might need the latest version of the program, v7.0 for the asian language thing. Which version are you running?

Graffiti: Try changing the file name to “English characters”—this should open the file.

TABLE 4

MEAN DIFFERENCES BETWEEN NEWBIES AND WIKIS

Variable	Newbies		Wikis	
	$\bar{x}$	σ	$\bar{x}$	σ
Reciprocity norm	2.78	1.36	3.99	.81
Voluntarism	2.33	.79	3.58	.89
Social trust	2.90	.94	3.75	.74
Informational value	2.52	1.05	4.23	.88
Social value	2.72	.97	3.35	.83
Commitment	2.43	1.12	4.09	.80

NOTE.— p -value $\Delta\bar{x} < .001$.

MarkATS: Or simply click on the link below, you can install the kit from there. [Weblink provided]

Ron: Great, Graffiti's trick worked, but downloading it is also great. Thanks!

Virtual communities are maintained by the normative influences that impose a moral responsibility to volunteer, to reciprocate, and to act in a trustworthy manner. Generalized reciprocity is one of the most important of these influences, creating the expectation that members are to help each other whenever possible, even if they do not receive an immediate reward in return. Instead, they trust that their help will be repaid by someone else at some point in the future. This idea is similar to Giesler's (2006) argument that peer-to-peer file-sharing networks operate as consumer gift systems, in which consumers share their files under the assumption that the entire community operates on the same premise. Although the gift exchanged in a virtual P3 community is knowledge, a generalized sense of reciprocity is governing interaction, as can be seen in the following exchange between Dorothy and Paul:

Dorothy: Can anybody please help me with this? I can't get the text field tool in the library palette to turn off! I tried everything.

Paul: Which text field of what library palette in which application?

Dorothy: Paul. You are wonderful for actually responding. In the meantime, I asked my son and he got rid of it. Thanks so much again!

Paul: Welcome. I help you, you'll help someone else, someone else'll help me—that's how it works here. Get your son to participate too. ☺

Community Markers: Consciousness of Kind

As validation of our quantitative findings and to provide support for the contention that virtual P3 communities are indeed genuine communities, we also observed what Muniz and O'Guinn (2001, 418) described as consciousness of

kind, defined as “the most important element of community.” Consciousness of kind reflects the social bond that is evident in the “intrinsic connection members feel toward one another, and the collective sense of difference from others not in the community.”

In virtual P3 communities, particularly in highly technical communities of practice (Wasko and Faraj 2005), this feeling of belonging to a group tends to stem from shared expert knowledge. The following post illustrates the feeling of belonging that has emerged from knowledge sharing between community contributors.

Robert: Thanks, I did find it miraculously—I could swear that it was not there before. . . . The letters are tiny, but there they are! . . . Thanks for your continued “watching”—this is a great “community” of true well wishers.

The knowledge-based connection that creates a collective sense of difference from others not in the community can also be seen in the following exchange:

Freda: I just have to share this, please indulge me.

Friend: Why does your Arial look different to my Arial?

Me: Because it's Quadraat Sans.
(The upside? She can see a difference. ☺)

Don: Ah yes, people think there are only two kinds of fonts, Arians and Times. She knew it wasn't a Times, so it had to be an Arial.

Neil: Don't throw a script or black letter font at her—might put her over the edge!

This discussion illustrates that the members of our community feel a “we-ness” based on their expertise that sets them apart from everyone else. They make fun of Freda's friend who does not belong to the in-group. Rather, she belongs to “them,” the “people who think there are only two kinds of fonts”—people our community members clearly look down upon. This demarcation from the ignorant masses underscores the similarities our community members perceive among themselves and contributes to a strong group feeling. While this example illustrates the cohesive influence of shared expert knowledge, opposing views can also surface among community experts, threatening the community as factions representing different perspectives splinter (Leigh et al. 2006). In both instances, however, shared “knowledge” is at the heart of establishing a strong connection that distinguishes community or subgroup members from outsiders. The consciousness of kind that we observed offers additional validation that virtual P3 activity can foster a genuine sense of community among P3 participants. This community has become much more than simply a question and answer forum. Instead, this collective has begun to define itself in interpersonal terms, as evidenced in the following post:

Tom: Absolutely fascinating. The tour is MUCH appreciated.

Thank you Jeff for taking time to make all of us other users feel like part of the family.

Participation in this virtual P3 community has taken on a familial tone, illustrating the social nature of the community experience. The discussion presented earlier between Alberto and Lawrence, two regular contributors to our virtual P3 community, also reflected this consciousness of kind, as the two came to perceive themselves as being part of a larger collective. Their participation in this community demonstrated a shared faith that members' needs would be met through their commitment to each other and to the larger community (McMillan and Chavis 1986; Ridings and Gefen 2004).

Community Markers: Rituals and Traditions

Communities are also characterized by shared rituals and traditions that emphasize a unique culture and often include symbolic gestures or specific language that is only meaningful to informed members (Muniz and O'Guinn 2001). The members of our virtual P3 community have instituted certain rituals and traditions. For example, every month, they engage in a “Name That Font” competition. The winner of the previous round has to find and post a picture of a rare font type that the other members then try to identify. The winner of the competition gets the nickname “Johannes” for the duration of his 1-month rule—after Johannes Gutenberg, the inventor of movable type printing. The winners are numbered, and during our data collection, we witnessed the respective triumphs of Johannes XXV and Johannes XXVI. This amusing tradition was born out of a serious query several years ago and has been enthusiastically continued by both long-term and newer members ever since.

Community Markers: Moral Responsibility

Not only do participants exhibit a sense of belonging and community identification, they are also seen to exhibit a sense of moral responsibility to their community's future. Virtual P3 communities can be quite fragile social structures given the porous borders that make membership open and noncommittal. Consequently, survival of the community is of prime concern for its core members who recognize that they must not only attract but retain new community members. Socialization into the group is key, as captured in Ian's words:

Ian: Experienced users have few problems. This forum is a rich area of mutual support for all of us. But the new user, tomorrow's experienced user, has a real struggle to join in. . . . If the forum is to be a key support for users, then a lot more usability engineering is needed to ensure that the new user does not fall down the learning cliff, but instead enjoys the experience and boosts the forum population before the oldies die off.

As Ian's statement reveals, he is worried about the process that turns a newbie into vital core members of the com-

munity and identifies some of the problems that he perceives can inhibit this process.

The positive exchanges found in the archives of this virtual P3 community tend to illustrate the normative influences than underlie social capital formation and provide evidence of the markers of community as defined by Muniz and O'Guinn (2001). As a shared sense of morality reflected in voluntarism and reciprocity as well as a consciousness of kind begins to emerge, trustworthiness can be taken for granted (Coleman 1988), and the community begins to operate as a cohesive social entity capable of collective action.

Social Capital Outcomes at the Individual versus Communal Level

One of the characteristics of social capital is that it operates at different levels of a social structure. It exists as potential energy available to be tapped to serve individuals in times of need or it can be mobilized to address broader communal or societal needs (Coleman 1988; Putnam 1993). The quantitative data analysis focused on the consequences of social capital harnessed to solve specific individual-level problems. From the qualitative data collected, we provide evidence of collective action, which is fundamental to conceptual discussions of social capital and community (Coleman 1988).

The virtual P3 community that we studied was hosted by a commercial sponsor. Consequently, its design was not under the control of the membership. In order to exert influence over how "their" community looks and operates, Jacob mobilizes the community toward collective action as seen by the following exchange:

Jacob: [The community's commercial sponsor] seems to be quite responsive to suggestions made by us. By aggregating our suggestions, we may have a unique opportunity to influence and help optimize the forums to come. Please add your suggestions! But be constructive, no bashing about what is wrong, but rather the functionalities we'd like to see.

Jacob's appeal resulted in over 200 replies, demonstrating that many members felt a shared sense of duty to actively shape the future of their community.

Negative comments uncovered in the community archives tended to relate to perceived product failures and illustrated how individual-level problem solving was elevated to collective action. In the following discussion thread, the community confirmed that a specific product failure was not attributable to user error. Instead, it was traced to the fact that the product had not been upgraded to support recent hardware advances. As you read through this exchange, you will see the community define the problem, plead with the firm to solve it, and eventually devise a series of strategies for working together to pressure the firm to respond. This exchange illustrates how the participants engaged in collective action.

Our virtual P3 community struggled over a 12-month period to solve a technical problem that existed with a prod-

uct that the sponsoring firm did not seem to be supporting. Rather than being viewed as product abandonment in which brand devotees are forced to operate in a survival mode awaiting the "second coming" of the brand (Muniz and Schau 2005), this situation is perceived to be a failure in functionality and responsiveness on the part of the product and its creator, eliciting the wrath of the community. The following excerpts illustrate their dilemma:

Thomas: Yeap that is true [the system] only works if the guy who sends you the document . . . converts it before sending it to you. So engineers, back to the drawing board because this version is useless!

JoNathan: It think it's great that [the company] has provided this forum, but it doesn't look like anyone from [the company] monitors it, as there does not appear to be an answer to the problem. C'mon. . . . Step up to the plate!

Bruce: So here we are a scant 8 weeks after I first posted to this forum and still NOTHING! Hello [sponsor] . . . are you out there?

After months of discussion, the frustration with the corporate sponsor of the virtual P3 community is beginning to show. The community members commiserate about the corporation's lack of responsiveness and suggest strategies for getting some answers.

Tom R: I work for a software company and I can't imagine that the required update . . . would be expensive. Like many lower priority development projects, it could be tossed to a low-cost overseas development subsidiary or contractor. How about it? Haven't you grown tired of the whining on this forum?

Len: We all agree and somehow we should be able to cause [the company] to make a [product that works], or maybe just maybe a 3rd party software company could write one. Hmmm. This seems to be so simple. "What is the holdup?"

David: The problem is not that they produced the wrong tool. They produced the right tool for the time at which it was written, and it is still the right tool for [older systems]. The problem is that they haven't created a new product that takes advantage of faster processors, extension memory, and [other capabilities] that have become common since the original product was produced.

Len: You are right on the "money." [The company] should be reading these messages because I think there is money to be made, even at a nominal fee we would all upgrade. Someone is asleep at the switch.

Finally, the P3 community users begin to talk about taking matters into their own hands. They have begun to threaten halfheartedly to release a competing product, and more seriously, they begin to urge each other to act together to force

change. Here are a few excerpts that illustrate their call for collective action.

Rahul: Hi To All The Developers at [the company] . . . PLZ PLZ & PLZ for the nth Time, release [a compatible version of your product]. I personally own both the models and I, like thousands of others, want [the company] to release their much anticipated [product]. Come on Guys Or, I will Be forced to release One. ☺ Just Kiddin !!!

Tester Testered: I noticed that [the company] staff doesn't read this forum or chooses to ignore it! So I suggest you fill out their survey like I did. Maybe then they will get the message. I'm sure I don't need to explain how disappointed you are with the support for a product that doesn't exist. ☺ The survey will take approximately 10 minutes to complete. Here's the address: <http://survey.ccsurvey.com/>.

Kmozis: To all: This is more than one year and [the company] did nothing—even do not answer. Let us all use [this recommended] competitive [product]. Let us share its [features] with all our business partners, let them know about this software. . . . Maybe when most of us and our business partners and their partners start to use [the competitor's product], then [the company] will wake up—if it will not be too late for them.

This exchange provides an example of a virtual P3 community as it escalates individual-level problem-solving activities into a collaborative effort to have their voice heard by the corporate sponsor. While the community has not gone so far as to boycott the corporate sponsor's products, members are beginning to suggest competitive alternatives, illustrating the collective power such communities can potentially wield.

DISCUSSION

The results of our analysis demonstrate empirically that social capital is a latent construct, an intangible resource that is determined by the normative influences of voluntarism, reciprocity, and social trust. We also provide empirical evidence for Putnam's (1995) central premise that social capital creates value for members of a social network. Information resources and social support systems emanate from social capital, constituting the valued outcomes of virtual P3 community engagement. This study documents the process that draws individuals into a virtual P3 community, a process that includes adoption of community norms, utilization and contribution to the community's informational resources, and, finally, formation of social connections that lead to commitment to the community.

The accumulation of social capital draws boundaries within collectivities (Bourdieu 1986) as communal identity is recognized through expressive consumption (Holt 1997). As we examined the perceived differences in the virtual P3 community experience, we found that longevity provides a proxy for the boundaries that demarcate newbies from established wikis. Specifically, the consumption of informa-

tional resources by newbies contrasts with the inherently social character of the virtual P3 community as experienced by the community's core. Regardless of whether it is viewed from the perspective of a newbie or a core member, the formative structure of the social capital construct remained constant. This observed stability in the structure of social capital provides added support for our hypothesized conceptualization.

The informational resources of this virtual P3 community attract newbies to the Web site and appear to serve as the primary reason for continued patronage. Problem solving and information exchange were also clearly important to the long-term wikis of the community. However, among these core members, commitment to the community was not based solely, or even principally, on the informational resources that arise from P3 activities. Instead, the social support long-term members experience appears to exert the most weight in determining whether this core group of contributors will remain active. This is reflective of consciousness of kind (Gusfield 1978) and illustrates the value inherent in the camaraderie among core members of this group (Nelson and Otnes 2005).

Virtual P3 community newbies, however, perceived the existence of the social support system as a significant, albeit relatively weak outcome of the community's social capital. For them, this social support had nothing to do with the commitment they felt toward the community, a sentiment that appears to change with time. In communication research, such a lag effect has been accounted for by the so-called social information processing theory (Walther 1994), which holds that instead of preventing social exchange, the limited bandwidth of computer-mediated communication slows down but eventually facilitates the development of social exchange.

Long-term members of this community came to regard each other as family, and it is the camaraderie they experience that cements their ongoing commitment to the community. This finding illustrates Bourdieu's point that the duration of social capital accumulation not only influences its outcome but delineates observable factions within a collective. He notes, "exchange transforms the things exchanged . . . and the recognition of group membership which it implies, re-produces the group" (Bourdieu 1986, 250).

Our results suggest that personally enriching relationships formed in highly utilitarian virtual settings can assume a communal character that complements and possibly supplants the instrumental aims of the virtual P3 community. The linking value experienced as these connections form provides a compelling example of community-based consumption in spatially dispersed social networks (Cova 1997). Additionally, the evidence of collective action we observed as the community organized to influence the business activities of their corporate sponsor validates our characterization of this assemblage as a community. Virtual P3 communities are capable of accumulating and deploying social capital at the individual as well as communal levels. We

therefore conclude that as underlying communal norms become ingrained, a community in the real sense of the word will begin to emerge.

Limitations and Future Research Implications

The results of this study were based on a cross-sectional survey of active virtual P3 community patrons. This can be viewed as a potential limitation to this study in that the long-term consequences of social capital accumulation have not been demonstrated. The cross-sectional limitations of the data can be addressed in future research with a longitudinal monitoring of social capital reserves. Longitudinal research would allow future investigators to document the dynamic evolution of virtual consumption-based community formation. Future researchers are encouraged to use social capital as a metric for tracking the strength and character of consumer relationships as they transition overtime into consumption-based communities.

Initial screening was used to ensure that respondents were experienced with the Web site's virtual P3 community. However, the respondent's self-selection into the study may have biased results. Specifically, the line of questioning administered may have been susceptible to a social desirability bias as respondents may have overemphasized the utilitarian benefits they realized from participation in the virtual P3 community, while understating the social or expressive benefits. Therefore, caution should be exercised when generalizing these findings beyond a commercially sponsored virtual P3 community such as the one examined here.

It is interesting to note that a relative minority of Web site visitors actively contributed to the virtual P3 dialogue in this study. Specifically, 25% of the respondents report lurking without contributing to the community discussion, 60% report occasionally contributing, 12% report they regularly contribute to P3 community discussions, and 3% characterize themselves as discussion leaders. This pattern of participation is consistent with levels reported in other studies (Bagozzi and Dholakia 2002) and illustrates the fragility of the virtual community building process, given its dependence on the handful of highly engaged individuals who comprise its nucleus. Kozinets (2002a, 66) similarly observes that the "core of insiders who are frequently quoted and referenced by other community members" operate as "important arbiters" of community interaction, assuming "an opinion leadership role in their local context." We strongly encourage future researchers to investigate the roles these various individuals play, examining the structure of relationships that link community wikis, newbies, or lurkers to actual consumption attitudes and behaviors. Structural equation or PLS modeling of these relationships could be used to shed light on our understanding of concepts like opinion leadership within the context of a virtual community of consumers.

This study is unlike previous work that focused on the "signs, symbols, material objects, or places" employed by individuals to construct an identity by digitally associating themselves with brands on their personal Web sites (Schau

and Gilly 2003, 385). Instead, social identity in a virtual P3 context results from one's interactions, which are often publicly evaluated using online feedback mechanisms. These reputation systems rely on "the Internet's bidirectional communication capabilities" to foster cooperation among strangers by ensuring that the behavior of one participant is publicly known by the entire community (Dellarocas 2003, 1407). Understanding the implications of a virtual identity that is publicly evaluated based on the merits of one's contribution as opposed to one that is constructed using self-selected words, pictures, or commercial brands is likely to present a fruitful area for future research.

Social capital is said to be the study of norms and networks. Research in FtF community settings suggests that the structure of a social network is likely to influence social capital accumulation. Putnam (1993), for example, observed the inhibiting effect of hierarchically structured communities on social capital formation in a small Italian village dominated by the Catholic Church. Newton (1997, 580) similarly contends that social capital is "strongly affected by the structures and policies of [community] governance." The informal governance systems that develop in virtual communities and the effect these systems have on value creation were not addressed in this study. As experts emerge from the ranks of community patrons and establish themselves, does their elevated status facilitate or inhibit community exchange? What is the process that promotes one to the status of wiki, and how does the network organize around these individuals? Does the community core operate as a tightly knit nucleus of strong ties that effectively close ranks once they have found each other, or are their borders porous, able to be penetrated by those on the periphery of the community? The interplay between network structure and a virtual P3 community's social/political climate would be a fascinating area for future study.

On a broader societal level, the outcomes of social capital include the ability to mobilize groups to exert political and social pressure (Minkoff 1997), to effect the efficient functioning of economic systems (Coleman 1988; Frenzen and Davis 1990; Putnam 1993), and to determine the health of a democratic society (Newton 1997; Paxton 1999; Putnam 1995). Some have speculated that virtual communities have begun to fill a void left unmet in the FtF world by creating a new public "third place" where people can volunteer their time, expertise, and resources (Blanchard and Horan 2000; Minkoff 1997). As virtual P3 communities mobilize their social capital, they may become a potent force in the marketplace. Uncovering the degree to which social capital accumulates in a virtual context and can be harnessed to exert a broader societal influence is beyond the scope of this study. There is some evidence in FtF communities, however, that the "private" social capital generated through interaction in voluntary groups does not translate into a generalized readiness to get involved in cooperative behavior that could benefit society beyond that particular group (Stolle 2001). Future researchers are encouraged to consider investigating

the societal implications, if any, of social capital accumulation in virtual consumption contexts.

Conclusion

Individuals who surf the Web with no objective other than to get answers to specific technical questions find reasons to linger and eventually settle into virtual P3 communities. In his studies of the culture of mass media consumption, Kozinets (2001, 97) notes that "articulation of morality and community are not only important marketing acts but also essential components of the meanings and practices that structure consumption on a cultural and sub-cultural level." We agree with this statement and find evidence of Kozinets's observation in the P3 activities that make people feel like "part of a family," or a member of a "great community of true well-wishers." The subculture of consumption (Schouten and McAlexander 1995) examined in this study has emerged from mundane and pragmatic roots relative to the media-based consumption behaviors documented by Kozinets (1997, 2001). Despite this, we find evidence of an idealized community, led by a noble cadre of wikis who are governed by a culture of voluntarism, trust, and reciprocity as they come to the aid of floundering newbies.

Normative influences were found to underlie the formation of social capital, suggesting a level of authenticity in this community experience, at least when viewed from the perspective of virtual P3 community patrons. Whether sociologists will come to agree that the social capital that surrounds and augments the consumption of products and services is authentic is yet to be determined (Peterson 2005). Despite this, we encourage researchers to continue to explore the social capital construct as a means to further our understanding of the act of consumption.

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